IS 10459 (1983): Specification for General Purpose Plug Valves [MED 17: Chemical Engineering Plants and Related Equipment]

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UDC 621·646·5

(Reaffirmed 1999)

Indian Standard

SPECIFICATION FOR GENERAL PURPOSE PLUG VALVES

Industrial Valves Sectional Committee, EDC 81 [Ref : Doc : EDC 81 (3736)]

1. Scope — Specifies requirements for straightway cast iron and carbon steel plug valves for general purposes.

1.1 This standard covers valves of nominal sizes DN 10 to DN 600 in classes 125, 150, 250, 300, 600 with flanged ends or with internal screw threads in accordance with IS : 554 for nominal sizes ¼ to 2.

2. Pattern — Valves may be of the short, regular or venturi pattern.

2.1 *Short Pattern* — The short pattern design has the same face-to-face dimensions as class 150 and 300 flanged steel gate valves.

2.2 *Regular Pattern* — As the plug ports in the regular pattern design are larger, the body, although designed as nearly as possible for streamline flow, does not approach the shape of a venturi throat. In this type, the plug port area is substantially greater than for the venturi valve.

2.3 *Venturi Pattern* — Valves of the venturi pattern shall be designed for minimum pressure loss consistant with the reduced port area used in this type of valve, and shall have a conjuction of body and plug ports approximating a venturi throat.

3. Nominal Size — The nominal size (DN) for flanged ends shall be as follows: 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600.

Note — Sizes 32 and 65 are non-preferred.

3.1 For screwed ends the nominal size shall be as follows :

1/4, 3/8, 1/2, 3/4, 1, 1¼, 1½, 2.

4. Pressure/Temperature Ratings — With the exception of seats and seals, all valve components shall be capable of withstanding the pressure/temperature ratings of the body for the class of valve concerned.

4.1 Maximum permissible working pressures in bar gauge and operating temperatures shall comply with the requirements for the shell material for the class of valve concerned except that they may be limited by the materials of the body linings and lubricants, seat rings, and/or seals. Due to the variety of lining and lubricants, materials, it will be necessary to refer to the manufacturer's recommendations for pressure/temperature ratings. Seals, however, shall be capable of withstanding the body test pressures.

5. End Connection

5.1 Threaded end valves shall be internally threaded complying with requirements of IS : 554-1975 ' Dimensions for pipe thread, where pressure tight joints are required on the threads *(second revision)* ', either taper or parallel at manufacturer's option unless the particular form is specified in the order.

5.1.1 End faces of parallel threaded valves shall be provided with a smooth finish at right angles to the thread axis. The minimum outside diameter of sealing face shall be in accordance with Table 1.

TABLE 1 MINIMUM OUTSIDE DIAMETER OF SEALING FACE

Nominal Size of Threading	Outside Diameter of Sealing Face
1/4	18
3/8	22
1/2	26
3/4	32
1	39
1¼	49
1½	55
2	68

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5.1.2 Other forms of threads may be provided when specified by the customer.

5.2 Flange dimensions shall comply with ' Indian Standard specification for steel pipe flanges and flanged fittings ' (*under preparation*).

5.2.1 Face to face dimensions shall comply with IS : 9884-1981 ' Dimensions for ferrous valves — face-to-face and end-to-end '.

5.2.2 End flange face shall be finished smooth for cast iron valves and raised face serrated for cast steel valves as per ' Indian Standard specification for steel pipe flanges and flanged fittings ' (*under preparation*). Any other type of facing shall be as specified by the purchaser.

5.2.3 End flanges of steel valves may be integral with or welded to the body. When flanges are welded they shall comply with requirement of ' Indian Standard specification for butt welded ends for pipes, valves, flanges and fittings ' (*under preparation*).

6. Drain Connection — When specified, the body shall be tapped on valves DN 80 and above as per IS : 9625 1980 ' Location of by-pass and drain connections for valves '.

7. Lubrication — Lubricated plug valves shall be provided with an internal lubricating system capable of delivering lubricant to the plug-body contact surfaces in the seal area. Check valves shall be provided in all cases where lubricant screw or grease gun feed arrangements are used for lubrication purposes. Lubricant screw or grease gun feed shall be given when specified by customer.

8. Operation — Valve shall be designed for direct operation either by handwheel or by wrench. The mode of operation that is handwheel or wrench shall be specified by the purchaser.

8.1 Manually operated valves shall close by turning the handwheel or wrench in a clockwise direction when facing the end of operating shaft, unless otherwise specified.

8.2 Handwheels shall be marked Close or Shut with an arrow to indicate the direction of closure. Alternatively this marking may be shown on a plate secured below handwheel nut.

8.3 Wrenches shall be designed so that it is parallel to the flow passage of the plug. These shall be supplied as separate items and only when specified by the customer.

8.4 Handwheel and wrenches shall be fitted in such a way that, whilst held securely, they may be removed and replaced when necessary. Suitable stops shall be provided for both fully open and fully closed positions of the valve.

8.5 If chainwheel or gear operation is required it shall be specified in the order which shall also specify any chain to be supplied or the type of gearing.

8.6 If actuator operation is required, the details of the actuator and its power supply together with the design maximum pressure differential across the valve shall be specified in the purchase order.

9. Materials — Materials for the valve components are specified in Table 2. Unless otherwise agreed, the manufacturer has the option of selecting materials listed in Table 2 or using other materials, providing they are at least as suitable in all relevant respects.

TABLE 2 VALVE COMPONENT MATERIALS

Components	Cast Iron Valves		Carbon Steel Valves	
	Material	Grades	Material	Grade/Class
Body	Cast Iron	FG 200* of IS : 210-1978	Carbon steel	Gr. I or Gr. II of IS : 2856-1979
Plug				Class II or Class III of IS : 1875-1978
Cover				Class II or Class III of IS : 2004-1978
Gland				

*To be used where section thickness at any point does not exceed 15 mm.

Bolting — Carbon Steel; Min, Tensile strength MPa 390 (N/mm²).
Seals and Gasket — Manufacturer's standard; suitable for duty.
Wrench/Handwheel — Malleable Iron, S.G. Iron or Steel.

10. Trim — Where valves are required with a particular trim, this shall be specified by the purchaser and in this case the materials used shall be subject to agreement between the manufacturer and the purchaser.

11. Inspection and Test — If inspection by purchaser is specified in the purchase order, inspection shall be as per IS : 6157-1981 ' Valve inspection and test (*first revision*) '.

12. Marking — Marking shall be as specified in IS : 9866-1981 ' Marking system for valves '.

12.1 *ISI Certification Marking* — Details available with Indian Standards Institution.

13. Despatch Preparation — Each valve shall be drained, cleaned, prepared and suitably protected for despatch in such a way as to minimise the possibility of damage and deterioration during transit and storage. Painting of the finished valve shall be at the option of the manufacturer unless specified by the purchaser.

13 1 All valve plugs shall be in the open position when despatched.

13.2 Valve ends shall be suitably sealed to exclude foreign matter during transit and storage.

14. Information to be given by Buyer

14.1 The following information to be given by buyer in an enquiry or order:

a) Pattern of valve (*see* **2**).

b) Nominal size DN (*see* **3**).

c) Nominal pressure — Class designation (*see* **1**).

d) Flanged ends, including facing (*see* **5.2.2** *and* **5.2.3**).

e) Screwed ends, state whether a specific thread form is required (taper or parallel) (*see* **5.1**).

f) Chainwheel and chain, if required (*see* **8.5**).

g) Gear operation, if required, including type and arrangement (*see* **8.5**).

h) Power operation if required, including power supply and maximum design differential pressure across the valve (*see* **8.6**).

j) Any preference for materials (*see* **9**).

k) State whether any of the following is required:

i) Drain connection (*see* **6**),
ii) Inspection is required by buyer (*see* **11**),
iii) Test certificate and number of copies (*see* **11**), and
iv) Painting.

EXPLANATORY NOTE

In the preparation of this standard assistance has been derived from BS : 5158-1974 ' Cast iron and carbon steel plug valves for general purposes ', issued by British Standards Institution; and API : 599-1970 ' Steel plug valves — flanged or butt welding ends ', issued by American Petroleum Institute.

Other reference standards are:

a) ISO : 2229 ' Equipment for the petroleum and natural gas industry — Steel pipe flanges, nominal sizes $\frac{1}{2}$ to 24 in. — Metric dimensions ', issued by the International Organization for Standardization.

b) ANSI B16·5-1981 ' Pipe flanges and flanged fittings, steel nickel alloy and other special alloys ', issued by American National Standards Institute.

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